

CLAIMS

1. A method of folding a bottom of a package (13), which comprises a sleeve (14) of packaging material with
5 a transversal seal (33) at the end of the bottom forming portion of the package (13), said portion having the shape of a fin (15), comprising the steps of
folding the fin (15) such that primary flaps (31) are created at the transversal ends of the fin,
10 breaking corners on the folded fin (15) in the boundary regions between the primary flaps (31) and the edge between the part of the sleeve (14) forming the bottom and the rest of the sleeve (14), such that secondary flaps (32) are folded in between the primary
15 flaps (31) and the remaining part of the fin (15), the secondary flaps (32) on each side of each primary flap (31) thereby being folded essentially towards each other,
folding the primary flaps (31) towards each other, and
20 pressing the primary flaps (31) towards the remaining part of the bottom forming part of the sleeve (14).
2. A method according to claim 1, wherein the bottom of the package (13) is folded into an octagonal shape.
- 25 3. A method according to claim 1 or 2, wherein the sleeve (14) has a longitudinal seal (22) and the fin (15) is pre-folded away from the longitudinal seal (22) prior to the primary flap-creating folding step.
4. A method according to claim 3, wherein the fin
30 (15) is heated during the pre-folding.
5. A method according to any one of the preceding claims, wherein the fin (15) is heated in a number of locations, where the fin (15) is arranged to be sealed during the pressing down-step, along its length, prior to
35 the pressing-down step.
6. A method according to any of the preceding claims, wherein a first partible external forming tool

(10) retains the package (13) during the pressing-down step.

7. A method according to claim 6, wherein the first partible external forming tool (10) is opened and closed
5 along the contours of a parallelogram.

8. A device for folding a bottom of a package (13), which package (13) comprises a sleeve (14) of packaging material with a transversal seal (33) at the end of the bottom forming portion of the package (13), said portion
10 having the shape of a fin (15), which device comprises a first folding unit (8) for folding the fin (15) such that primary flaps (31) are created at the transversal ends of it,

a breaking unit (7) for breaking corners on the
15 folded fin in the boundary regions between the primary flaps (31) and the edge between the part of the sleeve (14) forming the bottom and the rest of the sleeve (14), such that secondary flaps (32) are folded in between the primary flaps (31) and the remaining part of the fin
20 (15), the secondary flaps (32) on each side of each primary flap (31) thereby being folded essentially towards each other,

a second folding unit (12) for folding the primary flaps (31) against each other, and
25 a pressing unit (11) for pressing the primary flaps (31) towards the remaining part of the bottom forming part of the sleeve (14).

9. A device according to claim 8, which is arranged to fold the bottom into an octagonal shape.

30 10. A device according to claim 8, wherein the breaking unit (7) comprises four knives (7a) arranged in positions essentially on the corners of a rectangle, such that each respective knife is able to operate on a respective side of a respective primary flap (31).

35 11. A device according to any one of claims 8-10, wherein the sleeve (14) has a longitudinal seal (22) and

the device comprises means (5) for pre-folding the fin (15) away from the longitudinal seal (22).

12. A device according to claim 11, which comprises first means (6) for heating the pre-folded fin (15).

5 13. A device according to claim 12, wherein the means (5) for pre-folding the fin (15) and the first means (6) for heating the pre-folded fin (15) are arranged in a first sub-assembly (2).

10 14. A device according to claim 13, wherein at least one first cylinder (16) connected to a respective at least one first cam wheel (17) is arranged to control the movement of the first sub-assembly (2) and members thereof.

15 15. A device according to any one of claims 8-14, which comprises a first pair of brackets (21) for holding the breaking unit (7) and a second pair of brackets (20) for holding a second forming tool (25), which brackets (21, 20) are each provided with cam surfaces (23, 22), wherein one shaft (24) is arranged on each side of the
20 pairs to move along the cam surface (22, 23) on each side of the pairs and thereby simultaneously control the movement of the breaking unit (7) and the second forming tool (25).

25 16. A device according to any one of claims 8-15, which comprises at least one flap support (34) which is arranged to flatten the primary flaps (31) against the folding unit (8).

30 17. A device according to any one of claims 8-16, which comprises second means (9) for heating a number of locations on the folded fin (15) along its length, in which locations the fin (15) is arranged to be sealed.

18. A device according to claim 17, wherein the second heating means (9) are supplied with hot gas from a hot gas source via a sliding swivel connection.

35 19. A device according to claim 17 or 18, wherein the at least one flap support (34) is arranged to hold

the primary flaps (31) during the heating of the fin (15).

20. A device according to claim 17, 18 or 19, wherein the breaking unit (7), the folding unit (8), the flap support (34) and the second means (9) for heating
5 the fin (15) are arranged in a second sub-assembly (3).

21. A device according to claim 20, wherein at least one second cylinder (16) connected to a respective at least one second cam wheel (17) is arranged to control
10 the movement of the second sub-assembly (3) and members thereof.

22. A device according to any one of claims 8-21, which comprises a first partible forming tool (10) for retaining the package during the pressing down of the
15 flaps (31) towards the part of the bottom forming part of the sleeve (14).

23. A device according to claim 22, wherein each part of the first partible forming tool (10) is arranged to be opened and closed essentially along the contour of
20 a parallelogram.

24. A device according to claim 22 or 23, wherein the first partible forming tool (10), the pressing unit (11) and the second folding unit (12) are arranged in a third sub-assembly (4).

25. A device according to claim 24, wherein at least one third cylinder (16) connected to a respective at least one third cam wheel (17) is arranged to control the movement of the third sub-assembly (4) and members
25 thereof.

26. A device according to any one of claims 8-25, wherein at least one cylinder (16) is arranged to control the movement of at least one moving part comprised in the device, said at least one cylinder (16) being connected to one end of a respective at least one lever (19), which
30 lever (19) in turn is fixed in the other end (30) and arranged to abut against a respective rotating cam wheel, and the movement of which is controlled by the same.
35

27. A device according to claim 26, wherein the at least one cylinder (16) is arranged to pull the lever (19) towards the centre of the cam wheel (17).

28. A device according to claim 27, wherein the at least one lever (19) and the at least one cam wheel (17) are arranged to cyclically lift the at least one cylinder (16).

29. A device according to any one of claims 26-28, wherein at least two cylinders (16) are provided, each cylinder (16) being controlled via a respective lever (19) by a respective cam wheel (17), the at least two cam wheels (17) being arranged on a common rotating cam shaft (18).

30. A device according to any one of claims 26-29, wherein the lever (19) is arranged to abut against the cam wheel (17) at a point which is located a distance from the fixed end (30) of one third of the distance between the fixed end (30) and the cylinder (16).

31. A device according to any one of claims 26-30, wherein the moving parts comprise at least one of the following:

a first folding unit (8) for folding the fin such that primary flaps (31) are created at the sides of the fin,

a breaking unit (7) for breaking corners which creates secondary flaps (32) on the folded fin,

a second folding unit (12) for folding the primary flaps (31) against each other,

a pressing unit (11) for pressing down the primary flaps (31) towards the remaining part of the sleeve (14), means (5) for pre-folding the fin (15),

first means (6) for heating the pre-folded fin (15), second means (9) for heating the folded fin (15),

and

a first partible forming tool (10) for supporting the package during the pressing down of the primary flaps (31).

32. A package comprising a sleeve (14) of packaging material with a longitudinal seal (22), and a transversal seal (33) at the end of the bottom forming portion of the package (13), said portion having the shape of a fin

5 (15), wherein the bottom is folded such that

a middle portion of the fin (15) is folded towards the part of the sleeve (14) forming the bottom, and

the transversal end portions of the fin (15) are folded towards each other and the middle portion of the
10 fin, c h a r a c t e r i s e d in that

in regions between the sides of the transversal end portions of the fin, and the edges between the part of the sleeve (14) forming the bottom and the rest of the sleeve (14), folds (32) are provided on each side of each
15 transversal end portion and folded towards the fin (15) and the part of the sleeve (14) forming the bottom, in between the transversal end portion and the part of the sleeve (14) forming the bottom, such that the bottom has an essentially octagonal shape.

20 33. A package according to claim 31, wherein the fin (15) is folded away from the longitudinal seal (22),